Docket No. 10512/0006/25SD

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

Rhoads

SERIAL NO: Unknown : GROUP ART UNIT:

FILED: Herewith : EXAMINER:

FOR: METHODS FOR INSERTING AND DETECTING WATERMARKS IN DIGITAL DATA

37 CFR 1.607 REQUEST FOR AN INTERFERENCE WITH A PATENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

I. 37 CFR 1.607(a)(1)

The patent is U.S. patent No. 5,889,868 (hereinafter "the '868 patent") issued March 30, 1999, and naming Moskowitz et al. as inventors. The assignee at issue was The Dice Company.

II. 37 CFR 1.607(a)(2)

Applicant proposes the following count, which is in the format approved by the Commissioner in Orikasa v. Oonishi, 10 USPQ2d 1999, 2003 (Comm'r 1990), and Davis v. Uke, 27 USPQ2d 1180, 1188 (Comm'r 1993):

Claims 1-57 in the '868 patent

OR

Claims 1-57 in the Rhoads application.

An extra copy of the proposed count is submitted herewith for the examiner's use in filling out the form PTO-850. In addition, as explained in Section IX of this request, a proposed form PTO-850 and a disc containing the appendices to that proposed form are submitted herewith for the examiner's convenience.

III. 37 CFR 1.607(a)(3)

Claims 1-57 of the '868 patent correspond to the proposed count. Indeed, the proposed count includes all of the claims in that group of claims.

IV. 37 CFR 1.607(a)(4)

Claims 1-57 correspond to the proposed count. Indeed, the proposed count includes all of the claims in that group of claims.

V. 37 CFR 1.607(a)(5)

The terms of the application claims identified as corresponding to the proposed count can be applied to the disclosure of the application as follows:

Terms of the Claims of the '868 Patent (as Numbered in the Present Application)	Application to the Disclosure of the Application
1. A method for encoding of digital watermark information in a signal, comprising steps of:	

establishing a minimum and a maximum signal value;	Page 32 lines 17-25 discloses that a minimum value is established as 4 and a maximum value is established as 251.
determining a quantization interval for a range between the minimum and maximum signal values;	Page 32 lines 17-20 discloses that the quantization level is 8-bits.
receiving samples to be quantized into one of plural quantization levels corresponding to the quantization interval;	Page 32 lines 23-25 discloses that samples are received and are to be quantized according to the selected quantization interval.
comparing samples to the minimum and maximum signal values;	Page 32 lines 23-25 discloses that values outside an acceptable range are detected.
when a potential rail error occurs, adjusting the samples to correspond to a value between the minimum and maximum signal values; and	Page 32 lines 23-25 discloses that the input signal is modified if it falls outside the acceptable range.
storing the adjusted samples.	Page 32 lines 1-2 discloses that encoded signals are stored.
2. The method according to claim 1, wherein signal characteristics can be compressed.	Page 32 lines 12-16 disclose that a zero scaling factor can be used. This results in a totally compressed signal.
3. A method for decoding of digital watermark information in an encoded signal comprising steps of:	
determining a quantization interval of the encoded signal;	Page 32 lines 18-21 discloses that an 8-bit quantization is used.
determining minimum and maximum values corresponding to the quantization interval for the encoded signal;	Page 32 lines 22-25 discloses that minimum and maximum values that are acceptable for an 8-bit quantization.
receiving the encoded signal wherein samples within the encoded signal have been adjusted to conform to a limited range of	Page 32 lines 22-25 discloses that samples are adjusted if they would otherwise cause rail errors.

values represented by the quantization interval; and	
decoding the received signal to retrieve the watermark.	The specification inherently supports decoding signals encoded by the method described on page 32 lines 17-25.
4. The method according to claim 3, wherein signal characteristics can be compressed.	Page 32 lines 12-16 disclose that a zero scaling factor can be used. This results in a totally compressed signal.
5. A method of encoding and decoding watermarks in a signal, comprising insertion and detection of features in said signal to carry watermark information, wherein said features are mathematical functions of the input frame and adjacent frames.	The paragraph from page 56 line 24 to page 57 line 16 of the present application discloses that one embodiment of the present invention uses a sequence of images in which "multiple frames of a video stream [are used] in order to find a single N-bit identification word."
6. A method of pre-analyzing a digital signal for encoding digital watermarks using a digital filter comprising determining what changes in the digital signal will be affected by the digital filter.	Page 57 lines 17-31 discloses that compression alters the content of a signal (e.g., a movie). Thus, compression acts as a digital filter. Page 57 lines 28-31 disclose that after a pre-analysis, "we now have a rough cut at signatures which we know have a higher likelihood of surviving intact through the compression process, and we use this 'Compressed Master Snowy Movie' 756 to then go through this procedure of being scaled down 764, [and] added to the original movie 766." Page 58 lines 6-10 discloses that "Fig. 15 can be summarized as attempting to pre-condition the invisible signature signals in such a way that they are better able to withstand even quite appreciable compression. To reiterate a previously mentioned item as well, this idea equally applies to ANY such pre-identifiable process to which an image, and image sequence, or

audio track might be subjected. This clearly includes the JPEG process on still images."

7. The method according to claim 6, further comprising a step of encoding watermarks so as to ensure that the watermark will survive the changes introduced by the digital filter.

Page 57 lines 28-31 disclose that after a pre-analysis, "we now have a rough cut at signatures which we know have a higher likelihood of surviving intact through the compression process, and we use this 'Compressed Master Snowy Movie' 756 to then go through this procedure of being scaled down 764, [and] added to the original movie 766."

8. A method of error coding watermark message certificates using interleaved codes.

Page 27 lines 8-15 describes that every n-th bit of the watermark is treated in a similar fashion (e.g., either by adding or subtracting noise). By performing n signal processing steps for the first n watermark bits and then repeating the same process for the next n watermark steps, n codes are interleaved.

9. A method of pre-processing a watermark message certificate comprising determining an exact length of the watermark message as it will be encoded.

Page 6 lines 24-29 discloses that an N-bit identification word is placed onto an original signal. Page 5 lines 22-29 discloses that the size of the watermark message is selected in an application specific way. This selection occurs before processing, so the step of pre-processing is performed.

The paragraph crossing pages 50 and 51 discloses that, in one embodiment, the watermark message signifies information (e.g., a name or other text) rather than just a random sequence.

10. The method according to claim 9, further comprising a step of generating a watermark key which will provide at least one unique bit for each bit comprising the watermark message.

Page 11 lines 8-17 disclose that plural noise images, based on the size N of the identification word to be added, are combined according to the value of the identification word to form a combined noise sequence. This sequence acts as a one-time pad with a key having at least one

	unique bit for each bit comprising the watermark message.
11. A method of encoding a watermark in a digital signal, comprising the steps of:	
generating varying watermark key bits ; and	Page 61 lines 2-17 discloses that the watermark signal is generated from a first code set and then from a second code set. Thus, the bits vary between code sets.
encoding the watermark in the digital signal using the varying watermark key bits and characteristics of the digital signal.	Page 61 lines 2-17 discloses that the signals are decoded using the different code sets. Inherently, therefore, the signal was encoded using the varying watermark key bits. Page 7 lines 9-13 discloses that the watermark may need to be adjusted based on the digital signal to keep the composite signal within acceptable levels.
12. A method of encoding a watermark in a digital signal, comprising the steps of:	
generating varying watermark key bits ; and	Page 61 lines 2-17 discloses that the watermark signal is generated from a first code set and then from a second code set. Thus, the bits vary between code sets.
encoding the watermark in the digital signal using the varying watermark key bits.	Page 61 lines 2-17 discloses that the signals are decoded using the different code sets. Inherently, therefore, the signal was encoded using the varying watermark key bits.
13. A method of encoding a watermark in a digital signal, comprising the steps of:	
mapping key and processing state information to effect an encode/decode map; and	Page 61 lines 2-17 discloses that the watermark signal is generated from a first code set and then from a second code set. Thus, the bits vary between code sets.

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Page 7 lines 9-13 discloses that the watermark may need to be adjusted based on the digital signal to keep the composite signal within acceptable levels.

14. A method of encoding a watermark in a digital signal, comprising the steps of:

mapping key and processing state information to effect an encode/decode map; and

Page 61 lines 2-17 discloses that the watermark signal is generated from a first code set and then from a second code set. Thus, the bits vary between code sets.

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Page 7 lines 9-13 discloses that the watermark may need to be adjusted based on the digital signal to keep the composite signal within acceptable levels.

15. A method of guaranteeing watermark certificate uniqueness comprising attaching a user identification dependent hash of watermark data.

The paragraph crossing pages 107 and 108 discloses that "44 bits of the 64 bit identification word are assigned as an index of registered users ... [and the] remaining 20 bits are reserved as a hash code ...on the 44 bit identification code."

16. A method of generating a noise signal to produce watermark information, wherein the noise signal is a function of at least one variable which depends on key and processing state information.	Page 11 lines 8-17 discloses that a scanner is used to generate multiple noise images that are combined into a noise signal for producing a watermark. Page 10 lines 26-31 discloses that the noise images are combined according to a selected value N, thus N acts as a key. Since the noise images are combined according to corresponding positions between the multiple noise images, position acts as processing state information.
17. A method of varying a watermark to compensate for dither by changing a concentration of watermarking signal energy between higher and lower frequencies.	Page 74 lines 8-18 discloses that dithering effects are compensated for by pre-concentrating signal energy in lower frequencies of a group of pixels.
18. A method of encoding watermarks comprising steps of:	
offsetting at least one portion of the watermark bit stream; and encoding at least one instance of the watermark using said offset portion of the watermark bit stream.	Page 34 lines 13-24 discloses that some of the noise signals having a value of "0" can be offset to either +1 or -1.
19. A method of decoding watermarks comprising steps of:	
considering an original watermark synchronization signal, an inverted watermark synchronization signal, or inverted watermarks; and	Page 31, lines 24-30 discloses that a vertical retrace signal is used to encode as image.
decoding based on the considering step.	Decoding of an encoded signal is inherently taught by the specification.
20. A method of encoding watermarks in a signal using a spread spectrum technique to encode where the encoding methods is pseudo-random.	Page 116 lines 13-23 discloses that spread spectrum techniques can be used in a telephone as part of an encoder that uses pseudo-random noise.
21. A method of decoding watermarks in a signal using a spread spectrum technique to	Page 116 lines 13-23 discloses that spread spectrum techniques can be used in a telephone as part of an encoder that uses

decode where the decoding method is pseudo-random.	pseudo-random noise. Page 116 lines 6-11 discloses that a cell site includes a decoder for reversing the encoding process performed at the telephone.
22. The method of claim 21, wherein the information is encoded and the encoding method is pseudo-random.	Page 116 lines 13-23 discloses that spread spectrum techniques can be used in a telephone as part of an encoder that uses pseudo-random noise. Page 116 lines 6-11 discloses that a cell site includes a decoder for reversing the encoding process performed at the telephone.
23. A method of analyzing composite digitized signals for watermarks comprising steps of:	
obtaining a composite signal;	Page 8 lines 13-20 disclose that a suspect composite signal (including an original signal and a superimposed watermark) is digitized for analysis.
obtaining an unwatermarked sample signal;	Page 8 lines 3-4 discloses that the original signal is stored for later comparison. Page 8 lines 13-20 discloses that the original signal (that was placed retrieved from storage) is registered against the suspect signal. Thus, it is inherent that the unwatermarked sample is obtained.
time aligning the unwatermarked sample signal to the composite signal;	Page 8 lines 13-20 discloses that the original signal (that was placed retrieved from storage) is registered against the suspect signal, which may require compensating for removed segments..
gain adjusting the composite sample signal to a corresponding segment of the unwatermarked signal, determined in the time aligning step;	Page 8 lines 21-26 discloses that the composite and original signals are matched in an RMS sense which includes signal amplification.

estimating a watermarked sample signal by subtracting the unwatermarked signal from the adjusted composite signal; and	Page 8 lines 27-31 discloses that the adjusted composite signal and the original signal are subtracted.
scanning the estimated watermarked sample signal for watermarks.	Page 9 lines 4-18 discloses that the result of the subtraction is analyzed for the watermark.
24. A method for varying watermark encode/decode parameters automatically during the encoding or decoding of a watermark comprising steps of:	
a) assigning a list of desired parameters to a list of corresponding signal characteristics which indicate use of particular parameters;	Page 32 lines 3-11 discloses that the look-up table 204 includes a list of parameters (i.e., scaling factors) corresponding to signal characteristics.
b) during encoding/decoding, analyzing characteristics of the current sample frame in the signal stream, prior to encoding a portion of the frame;	Page 23 lines 21-24 discloses that the signal stream is input to the address input 220 of the look-up table 204.
c) looking up the corresponding parameter from the list of parameters in step (a) which matches the observed signal characteristics from step (b);	Page 23 lines 24-25 discloses that the look-up table looks up the scaling factor corresponding to the input signal.
d) loading and/or preparing the desired parameter;	Page 23 lines 25-26 discloses that the scaling factor is loaded to be an input to the first scaler 208.
e) encoding the portion of the sample frame using the parameter selected in step (c).	Page 24 lines 25-29 discloses that the scaling factor is combined with the input signal to produce a composite signal.
25. The method according to claim 24, wherein signal characteristics can be compressed.	Page 32 lines 12-16 disclose that a zero scaling factor can be used. This results in a totally compressed signal.
26. A method for varying watermark encode/decode algorithms automatically	

during the encoding or decoding of a watermark comprising steps of:	
a) assigning a list of desired parameters to a list of index values;	See support section for step a) of claim 24.
b) during encoding/decoding, computing the index value for the current sample frame in the signal stream, prior to encoding a portion of the frame;	See support section for step b) of claim 24.
c) looking up the corresponding parameter from the list of parameters in step (a) which matches the index value from step (b);	See support section for step c) of claim 24.
d) loading and/or preparing the desired parameter;	See support section for step d) of claim 24.
e) encoding the portion of the sample frame using the parameter selected in step (c) in combination with an application specific scaling factor.	See support section for step e) of claim 24. Page 24 lines 6-11 discloses that a second scaling factor based on application requirements is used in the encoding process.
27. The method according to claim 26, wherein signal characteristics can be compressed.	Page 32 lines 12-16 disclose that a zero scaling factor can be used. This results in a totally compressed signal.
28. The method of claim 23, further comprising the step of accessing amplitude information in the watermarked sample signal.	Page 8 lines 21-26 disclose that a search on amplification data is performed.
29. The method of claim 28, wherein the change in amplitude information represents a variation from the unwatermarked sample signal.	Page 8 lines 13-26 discloses that the cross-correlation and RMS analysis is performed to re-align, in time and signal strength, the original and suspect signals in light of changes to the original image.
30. The method of claim 28, wherein the amplitude information represents a signal	The amplitude of a signal is clearly a signal characteristic.

characteristic parameter for use in watermark decoding.	
31. The method of claim 1, further comprising the step of randomly encoding watermark bits in the signal using a digital noise source.	Page 30 lines 15-19 discloses that a random/noise source is generated according to a digital algorithm of a computer.
32. The method of claim 31, the digital noise source comprises an algorithm digital noise source.	See support for claim 31.
33. The method of claim 32, wherein the digital noise source is seeded with a predetermined key.	Page 30 lines 15-19 disclose that the algorithmic noise source is seeded with a known key number.
34. The method of claim 31, further comprising the step of spreading watermarking signal energy across a group of pixels to compensate for dithering.	See support section for claim 17.
35. The method of claim 1, further comprising the step of encoding message bits in the signal using a digital noise source.	Page 47 lines 1-5 discloses that the decoder can decode a message in a signal if the decoder has access to the memory 214. Page 30 lines 15-19 discloses that the noise source in the memory 214 can be generated using a digital noise source. The step of encoding according to the reverse process is inherently disclosed.
36. The method of claim 35, the digital noise source comprises an algorithm digital noise source.	See support section for claim 31.
37. The method of claim 36, wherein the digital noise source is seeded with a predetermined key.	Page 30 lines 15-19 disclose that the algorithmic noise source is seeded with a known key number.
38. The method of claim 35, further comprising the step of spreading a watermark signal across a group of bits to compensate for dither.	See support section for claim 17.

39. The method of claim 15, further comprising the step of using additional bits to verify the user corresponding to the user identification dependent hash.	The paragraph crossing pages 107 and 108 discloses that the user is identified by the 44 bits preceding the hash.
40. The method of claim 1, further comprising the step of adding one or more hash bits to a user set of bits before encoding the watermark.	The paragraph crossing pages 107 and 108 discloses that the user is identified by the 44 bits preceding the hash.
41. The method of claim 1, further comprising the step of randomly varying two or more adjacent frames.	See support section for claim 5.
42. The method of claim 5, further comprising the step of randomly varying two or more adjacent frames.	See support section for claim 5.
43. The method of claim 3, further comprising the step of changing an input sample.	Page 32 lines 21-25 discloses that input samples are updated in order to prevent rail errors.
44. The method of claim 3, wherein a watermark occupies more time than a single frame.	See support section for claim 5.
45. The method of claim 44, wherein a redundant block code is used to encode watermark bits, such that n bits are encoded into a block having a length of m bits, where m is greater than n.	The paragraph crossing pages 45 and 46 discloses that a unique identification code word is redundantly encoded within a block. Block is longer than the code word, the specification supports this limitation.
46. The method of claim 6, further comprising the step of encoding an audio watermark by first determining where watermark bits are inaudibly suited without introducing audible artifacts.	Page 33 lines 6-14 discloses that the level of the embedded signal is to be made low enough that the embedded signal is imperceptible. Page 4 lines 23-26 disclose that the techniques are applicable to both audio and image signals.
47. The method of claim 46, wherein the watermark bits are encoded below the predicted masking level.	Page 33 lines 6-14 discloses that the level of the embedded signal is to be made low enough that the embedded signal is imperceptible.

48. The method of claim 46, wherein the watermark bits are encoded orthogonally.	Page 17 lines 10-17 disclose that the signals can be added orthogonally.
49. The method of claim 7, further comprising the step of encoding an audio watermark by first determining where watermark bits are inaudibly suited without introducing audible artifacts.	See support section for claim 46.
50. The method of claim 49, wherein the watermark bits are encoded below the predicted level.	See support section for claim 47.
51. The method of claim 49, wherein the watermark bits are encoded orthogonally.	See support section for claim 48.
52. The method of claim 6, further comprising the step of encoding an image watermark by first determining where watermark bits are invisibly suited without introducing visible artifacts.	See support section for claim 46.
53. The method of claim 52, wherein the watermark bits are encoded below the predicted level.	See support section for claim 47.
54. The method of claim 52, wherein the watermark bits are encoded orthogonally.	See support section for claim 48.
55. The method of claim 7, further comprising the step of encoding an image watermark by first determining where watermark bits are invisibly suited without introducing visible artifacts.	See support section for claim 46.
56. The method of claim 55, wherein the watermark bits are encoded below the masking level.	See support section for claim 47.
57. The method of claim 55, wherein the watermark bits are encoded orthogonally.	See support section for claim 48.

VI. 37 CFR 1.607(a)(6)

37 CFR 1.607(a)(6) is irrelevant since claims 1-57 were filed prior to one year from the date on which the Moskowitz et al. patent was granted.

VII. REQUEST FOR THE BENEFIT OF THE FILING DATES OF APPLICANT'S PRIORITY APPLICATIONS

Applicant claims priority under 35 USC 120 based upon the following applications: application No. 09/186,962, filed November, 5, 1998, which is a continuation of application 08/649,419, filed May 16, 1996 (now Patent 5,862,260), which is a continuation-in-part of application 08/637,531, filed April 25, 1996 (now Patent 5,822,436). Application 08/637,531 claims priority to applications 08/534,005, filed September 25, 1995 (now patent 5,832,119); 08/512,993, filed August 9, 1995 (now abandoned); 08/508,083, filed July 27, 1995 (now patent 5,841,978); 08/436,098, filed May 8, 1995 (now patent 5,636,292); 08/327,426, filed October 21, 1994 (now patent 5,768,426); 08/215,289, filed March 17, 1994 (now abandoned); and 08/154,866, filed November 18, 1993 (now abandoned). Applicant is entitled to the benefit of the filing dates of each of their earlier filed applications for interference purposes if the count reads on at least one adequately disclosed embodiment in the earlier application.[1] Assuming that the examiner recommends to the board applicant's proposed count, applicant clearly meets that standard. That this is so is demonstrated from the fact that this application is a division of the '962 application, which is a continuation of the '419 application, which is a continuation-in-part of the '531 application. Consequently, applicant's earlier filed divisional and continuation

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[1] Weil v. Fritz, 572 F.2d 856, 865-66 n.16, 196 USPQ 600, 608 n.16 (CCPA 1978).

applications have the same disclosure as the instant application, and the application of the terms of the claims to the disclosure in Section V herein is equally applicable to the disclosures of the parent applications.

VIII. 37 CFR 1.608

37 CFR 1.608 is irrelevant since the effective filing date of this application precedes the effective filing date of the '868 patent.

For the foregoing reasons, the party Rhoads should be the senior party in the requested interference.

IX. SUBMISSION OF PROPOSED FORM PTO-850

Submitted herewith for the convenience of the examiner are (1) a proposed form PTO-850 and (2) a disc containing the appendices to that form.

Respectfully submitted,

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6. Proposed Count

Claims 1-57 in the Moskowitz et al. patent

OR

Claims 1-57 in the Rhoads application.

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determining a quantization interval for a range between the minimum and maximum signal values;	Page 32 lines 17-20 discloses that the quantization level is 8-bits.
receiving samples to be quantized into one of plural quantization levels corresponding to the quantization interval;	Page 32 lines 23-25 discloses that samples are received and are to be quantized according to the selected quantization interval.
comparing samples to the minimum and maximum signal values;	Page 32 lines 23-25 discloses that values outside an acceptable range are detected.
when a potential rail error occurs, adjusting the samples to correspond to a value between the minimum and maximum signal values; and	Page 32 lines 23-25 discloses that the input signal is modified if it falls outside the acceptable range.
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determining minimum and maximum values corresponding to the quantization interval for the encoded signal;	Page 32 lines 22-25 discloses that minimum and maximum values that are acceptable for an 8-bit quantization.
receiving the encoded signal wherein samples within the encoded signal have been adjusted to conform to a limited range of values represented by the quantization interval; and	Page 32 lines 22-25 discloses that samples are adjusted if they would otherwise cause rail errors.
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likelihood of surviving intact through the compression process, and we use this 'Compressed Master Snowy Movie' 756 to then go through this procedure of being scaled down 764, [and] added to the original movie 766."

Page 58 lines 6-10 discloses that "Fig. 15 can be summarized as attempting to pre-condition the invisible signature signals in such a way that they are better able to withstand even quite appreciable compression. To reiterate a previously mentioned item as well, this idea equally applies to ANY such pre-identifiable process to which an image, and image sequence, or audio track might be subjected. This clearly includes the JPEG process on still images."

7. The method according to claim 6, further comprising a step of encoding watermarks so as to ensure that the watermark will survive the changes introduced by the digital filter.	Page 57 lines 28-31 disclose that after a pre-analysis, "we now have a rough cut at signatures which we know have a higher likelihood of surviving intact through the compression process, and we use this 'Compressed Master Snowy Movie' 756 to then go through this procedure of being scaled down 764, [and] added to the original movie 766."
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occurs before processing, so the step of pre-processing is performed.

The paragraph crossing pages 50 and 51 discloses that, in one embodiment, the watermark message signifies information (e.g., a name or other text) rather than just a random sequence.

10. The method according to claim 9, further comprising a step of generating a watermark key which will provide at least one unique bit for each bit comprising the watermark message.	Page 11 lines 8-17 disclose that plural noise images, based on the size N of the identification word to be added, are combined according to the value of the identification word to form a combined noise sequence. This sequence acts as a one-time pad with a key having at least one unique bit for each bit comprising the watermark message.
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Page 7 lines 9-13 discloses that the watermark may need to be adjusted based on the digital signal to keep the composite signal within acceptable levels.

14. A method of encoding a watermark in a digital signal, comprising the steps of:

mapping key and processing state information to effect an encode/decode map; and

Page 61 lines 2-17 discloses that the watermark signal is generated from a first code set and then from a second code set. Thus, the bits vary between code sets.

Page 31 lines 24-30 discloses that the state of the vertical retrace signal causes a change in the code word used.

encoding the watermark in the digital signal using the encode/decode map and characteristics of the digital signal.

Page 61 lines 2-17 discloses that the signals are decoded using the different code sets. Inherently, therefore, the signal was encoded using the varying watermark key bits.

Page 7 lines 9-13 discloses that the watermark may need to be adjusted based on the digital signal to keep the composite signal within acceptable levels.

15. A method of guaranteeing watermark certificate uniqueness comprising attaching a user identification dependent hash of watermark data.

The paragraph crossing pages 107 and 108 discloses that "44 bits of the 64 bit identification word are assigned as an index of registered users ... [and the] remaining 20 bits are reserved as a hash code ...on the 44 bit identification code."

16. A method of generating a noise signal to produce watermark information, wherein the noise signal is a function of at least one variable which depends on key and processing state information.

Page 11 lines 8-17 discloses that a scanner is used to generate multiple noise images that are combined into a noise signal for producing a watermark. Page 10 lines 26-31 discloses that the noise images are combined according to a selected value N, thus N acts as a key. Since the noise images are combined according to corresponding positions between the multiple noise images, position acts as processing state information.

17. A method of varying a watermark to compensate for dither by changing a concentration of watermarking signal energy between higher and lower frequencies.

Page 74 lines 8-18 discloses that dithering effects are compensated for by pre-concentrating signal energy in lower frequencies of a group of pixels.

18. A method of encoding watermarks comprising steps of:

offsetting at least one portion of the watermark bit stream; and encoding at least one instance of the watermark using said offset portion of the watermark bit stream.

Page 34 lines 13-24 discloses that some of the noise signals having a value of "0" can be offset to either +1 or -1.

19. A method of decoding watermarks comprising steps of:

considering an original watermark synchronization signal, an inverted watermark synchronization signal, or inverted watermarks; and	Page 31, lines 24-30 discloses that a vertical retrace signal is used to encode as image.
decoding based on the considering step.	Decoding of an encoded signal is inherently taught by the specification.
20. A method of encoding watermarks in a signal using a spread spectrum technique to encode where the encoding methods is pseudo-random.	Page 116 lines 13-23 discloses that spread spectrum techniques can be used in a telephone as part of an encoder that uses pseudo-random noise.
21. A method of decoding watermarks in a signal using a spread spectrum technique to decode where the decoding method is pseudo-random.	Page 116 lines 13-23 discloses that spread spectrum techniques can be used in a telephone as part of an encoder that uses pseudo-random noise. Page 116 lines 6-11 discloses that a cell site includes a decoder for reversing the encoding process performed at the telephone.
22. The method of claim 21, wherein the information is encoded and the encoding method is pseudo-random.	Page 116 lines 13-23 discloses that spread spectrum techniques can be used in a telephone as part of an encoder that uses pseudo-random noise. Page 116 lines 6-11 discloses that a cell site includes a decoder for reversing the encoding process performed at the telephone.
23. A method of analyzing composite digitized signals for watermarks comprising steps of:	
obtaining a composite signal;	Page 8 lines 13-20 disclose that a suspect composite signal (including an original signal and a superimposed watermark) is digitized for analysis.
obtaining an unwatermarked sample signal;	Page 8 lines 3-4 discloses that the original signal is stored for later comparison. Page 8 lines 13-20 discloses that the original signal (that was placed retrieved from storage) is registered against the suspect signal. Thus, it

	is inherent that the unwatermarked sample is obtained.
time aligning the unwatermarked sample signal to the composite signal;	Page 8 lines 13-20 discloses that the original signal (that was placed retrieved from storage) is registered against the suspect signal, which may require compensating for removed segments..
gain adjusting the composite sample signal to a corresponding segment of the unwatermarked signal, determined in the time aligning step;	Page 8 lines 21-26 discloses that the composite and original signals are matched in an RMS sense which includes signal amplification.
estimating a watermarked sample signal by subtracting the unwatermarked signal from the adjusted composite signal; and	Page 8 lines 27-31 discloses that the adjusted composite signal and the original signal are subtracted.
scanning the estimated watermarked sample signal for watermarks.	Page 9 lines 4-18 discloses that the result of the subtraction is analyzed for the watermark.
24. A method for varying watermark encode/decode parameters automatically during the encoding or decoding of a watermark comprising steps of:	
a) assigning a list of desired parameters to a list of corresponding signal characteristics which indicate use of particular parameters;	Page 32 lines 3-11 discloses that the look-up table 204 includes a list of parameters (i.e., scaling factors) corresponding to signal characteristics.
b) during encoding/decoding, analyzing characteristics of the current sample frame in the signal stream, prior to encoding a portion of the frame;	Page 23 lines 21-24 discloses that the signal stream is input to the address input 220 of the look-up table 204.
c) looking up the corresponding parameter from the list of parameters in step (a) which matches the observed signal characteristics from step (b);	Page 23 lines 24-25 discloses that the look-up table looks up the scaling factor corresponding to the input signal.
d) loading and/or preparing the desired parameter;	Page 23 lines 25-26 discloses that the scaling

	factor is loaded to be an input to the first scaler 208.
e) encoding the portion of the sample frame using the parameter selected in step (c).	Page 24 lines 25-29 discloses that the scaling factor is combined with the input signal to produce a composite signal.
25. The method according to claim 24, wherein signal characteristics can be compressed.	Page 32 lines 12-16 disclose that a zero scaling factor can be used. This results in a totally compressed signal.
26. A method for varying watermark encode/decode algorithms automatically during the encoding or decoding of a watermark comprising steps of:	
a) assigning a list of desired parameters to a list of index values;	See support section for step a) of claim 24.
b) during encoding/decoding, computing the index value for the current sample frame in the signal stream, prior to encoding a portion of the frame;	See support section for step b) of claim 24.
c) looking up the corresponding parameter from the list of parameters in step (a) which matches the index value from step (b);	See support section for step c) of claim 24.
d) loading and/or preparing the desired parameter;	See support section for step d) of claim 24.
e) encoding the portion of the sample frame using the parameter selected in step (c) in combination with an application specific scaling factor.	See support section for step e) of claim 24. Page 24 lines 6-11 discloses that a second scaling factor based on application requirements is used in the encoding process.
27. The method according to claim 26, wherein signal characteristics can be compressed.	Page 32 lines 12-16 disclose that a zero scaling factor can be used. This results in a totally compressed signal.

28. The method of claim 23, further comprising the step of accessing amplitude information in the watermarked sample signal.	Page 8 lines 21-26 disclose that a search on amplification data is performed.
29. The method of claim 28, wherein the change in amplitude information represents a variation from the unwatermarked sample signal.	Page 8 lines 13-26 discloses that the cross-correlation and RMS analysis is performed to re-align, in time and signal strength, the original and suspect signals in light of changes to the original image.
30. The method of claim 28, wherein the amplitude information represents a signal characteristic parameter for use in watermark decoding.	The amplitude of a signal is clearly a signal characteristic.
31. The method of claim 1, further comprising the step of randomly encoding watermark bits in the signal using a digital noise source.	Page 30 lines 15-19 discloses that a random/noise source is generated according to a digital algorithm of a computer.
32. The method of claim 31, the digital noise source comprises an algorithm digital noise source.	See support for claim 31.
33. The method of claim 32, wherein the digital noise source is seeded with a predetermined key.	Page 30 lines 15-19 disclose that the algorithmic noise source is seeded with a known key number.
34. The method of claim 31, further comprising the step of spreading watermarking signal energy across a group of pixels to compensate for dithering.	See support section for claim 17.
35. The method of claim 1, further comprising the step of encoding message bits in the signal using a digital noise source.	Page 47 lines 1-5 discloses that the decoder can decode a message in a signal if the decoder has access to the memory 214. Page 30 lines 15-19 discloses that the noise source in the memory 214 can be generated using a digital noise source. The step of encoding according to the reverse process is inherently disclosed.

36. The method of claim 35, the digital noise source comprises an algorithm digital noise source.	See support section for claim 31.
37. The method of claim 36, wherein the digital noise source is seeded with a predetermined key.	Page 30 lines 15-19 disclose that the algorithmic noise source is seeded with a known key number.
38. The method of claim 35, further comprising the step of spreading a watermark signal across a group of bits to compensate for dither.	See support section for claim 17.
39. The method of claim 15, further comprising the step of using additional bits to verify the user corresponding to the user identification dependent hash.	The paragraph crossing pages 107 and 108 discloses that the user is identified by the 44 bits preceding the hash.
40. The method of claim 1, further comprising the step of adding one or more hash bits to a user set of bits before encoding the watermark.	The paragraph crossing pages 107 and 108 discloses that the user is identified by the 44 bits preceding the hash.
41. The method of claim 1, further comprising the step of randomly varying two or more adjacent frames.	See support section for claim 5.
42. The method of claim 5, further comprising the step of randomly varying two or more adjacent frames.	See support section for claim 5.
43. The method of claim 3, further comprising the step of changing an input sample.	Page 32 lines 21-25 discloses that input samples are updated in order to prevent rail errors.
44. The method of claim 3, wherein a watermark occupies more time than a single frame.	See support section for claim 5.
45. The method of claim 44, wherein a redundant block code is used to encode watermark bits, such that n bits are encoded	The paragraph crossing pages 45 and 46 discloses that a unique identification code word is redundantly encoded within a block.

into a block having a length of m bits, where m is greater than n.	Block is longer than the code word, the specification supports this limitation.
46. The method of claim 6, further comprising the step of encoding an audio watermark by first determining where watermark bits are inaudibly suited without introducing audible artifacts.	Page 33 lines 6-14 discloses that the level of the embedded signal is to be made low enough that the embedded signal is imperceptible. Page 4 lines 23-26 disclose that the techniques are applicable to both audio and image signals.
47. The method of claim 46, wherein the watermark bits are encoded below the predicted masking level.	Page 33 lines 6-14 discloses that the level of the embedded signal is to be made low enough that the embedded signal is imperceptible.
48. The method of claim 46, wherein the watermark bits are encoded orthogonally.	Page 17 lines 10-17 disclose that the signals can be added orthogonally.
49. The method of claim 7, further comprising the step of encoding an audio watermark by first determining where watermark bits are inaudibly suited without introducing audible artifacts.	See support section for claim 46.
50. The method of claim 49, wherein the watermark bits are encoded below the predicted level.	See support section for claim 47.
51. The method of claim 49, wherein the watermark bits are encoded orthogonally.	See support section for claim 48.
52. The method of claim 6, further comprising the step of encoding an image watermark by first determining where watermark bits are invisibly suited without introducing visible artifacts.	See support section for claim 46.
53. The method of claim 52, wherein the watermark bits are encoded below the predicted level.	See support section for claim 47.
54. The method of claim 52, wherein the watermark bits are encoded orthogonally.	See support section for claim 48.

55. The method of claim 7, further comprising the step of encoding an image watermark by first determining where watermark bits are invisibly suited without introducing visible artifacts.	See support section for claim 46.
56. The method of claim 55, wherein the watermark bits are encoded below the masking level.	See support section for claim 47.
57. The method of claim 55, wherein the watermark bits are encoded orthogonally.	See support section for claim 48.

8 **<To be completed by the examiner.>**

9. Not applicable